MOUND

Environmental Restoration Program

The MOUND Tritium D&D Large-Scale Demonstration and Deployment Project

NOCHAR PETRO BOND ABSORBENT POLYMER OIL SOLIDIFICATION AGENT

THE NEED

In August of 1999, the U.S. Department of Energy Mound Environmental Management Project (DOE-MEMP) Office and BWXT of Ohio, Inc. conducted a demonstration using Nochar Petro Bond polymer oil absorbent. The intent of the demonstration was to compare the Nochar Petro Bond polymer agent against the baseline options for disposal which are incineration, long term storage for decay and use of existing organic solidification agents. There is a critical need at the DOE-MEMP for a simple and effective disposal method for tritiated oil, preferably something that will meet waste acceptance criteria (WAC) requirements at the Nevada Test Site (NTS). Vacuum pumps that supported glove boxes used over the past several decades produced reservoirs of highly trititated and heavy metal laced waste oils as defined by the Resource Conservation & Recovery Act (RCRA). This critical need is compounded by the fact that the Mound Site is now shutdown and undergoing remediation and tritiated oil disposal is on the critical path.

THE TECHNOLOGY

The innovative technology that has been demonstrated in the LSDDP at Mound is a high technology polymer solidifying agent offered by the Nochar Corporation of Indianapolis, Indiana. The company has extensive experience in major commercial oil and oil-spill operations. The Nochar agent will absorb oil with no mixing or required mixing equipment, and with a combination or “formula” of high tech polymers can be specifically designed to address the characteristics of waste oil as it exists on a given site. The Nochar Petro Bond product can be effectively used for free liquid control in storage, transport, and disposal of radioactive and RCRA defined waste oils. Petro Bond Polymer crystals have been found to be non-toxic, non-biodegradable and incinerable to less than 0.02% ash with an absorbent capacity of up to 15:1 (oil to solidification agent ratio by weight).

THE DEMONSTRATION

The Mound demonstration was conducted in three phases with non-radioactive RCRA oil used in a number of bench tests during phase I, clean oil as adapted to a DOT certified shipping package in phase II, and tritium contaminated RCRA oil solidified in a 22 gallon DOT shipping container in phase III. In all phases, the specific Nochar formula that was developed for Mound waste oil was used; data was collected in the areas of cost, time and motion, materials and equipment, and other pertinent issues and data.

RESULTS

In all phases of the Demonstration the Nochar agent formed an acceptable solidified mass with waste oils. The Toxicity Characteristics Leaching Procedure (TCLP) values were found to be several magnitudes below burial site limits on specific metals. The product proved very easy to use and required no agitation or mixing, thus facilitating safety & ALARA. The material can absorbed the eight gallons of oil used in the demonstration within 1 hour, providing a quick and efficient solidification agent. In a restrictive environment that will not allow for mixing and/or other typical solidification steps this agent would prove to be the idea material. The product is safe, easy to use, and cost effective and has the potential to produce considerable savings over other disposal options.

BWXT of Ohio, Inc.

NETL National Energy Technology Laboratory

University of California
Lawrence Livermore National Laboratory

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NOCHAR Petro Bond®

Absorbent Polymer Oil Solidification Agent

An innovative waste oil disposal process offered by NOCHAR, Inc.

The purpose of this absorbing agent is to perform safe, efficient solidification of radioactive/ mixed waste oils and provide an acceptable means of transportation and disposal.

BENEFITS:

- A single step process - does not require mixing
- Minimizes processing times by reducing handling, and having minimal setup times
- Reduces worker exposure (ALARA)
- Increases productivity & improved project schedule
- Provides an overall cost savings for treatment and disposal of tritiated oil
- Specific “custom” formulas easily developed
- Disposal / Shipping container can be preloaded with Petro Bond® at the factory
- Virtually no processing equipment required

MATERIAL:

- Non-toxic, non-biodegradable, and incinerable to less than 0.02% ash
- Absorbent capacity of up to 15:1 $^{w}/_{o}$ depending on material
- Absorbs quickly and with a minimal increase in sorbate volume

BASELINE TECHNOLOGY:

- Incineration had been used as a method for tritium-contaminated oil disposal but current regulatory requirements, which drive the costs, make this option unfeasible except in small quantities
- Available organic solidification agents require extensive mixing – can lead to problems